



Research Article

Validation Study of the Spanish Version of the Pandemic (COVID-19) Anxiety Travel Scale in Peru

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Abstract

The COVID-19 pandemic has changed tourists' thoughts, feelings and ways of travelling. In this regard, the aim of the present study was to evaluate the psychometric properties of the Pandemic Anxiety Travel Scale (PATS) using CTT and IRT. A total of 454 participants, with a mean age of 31.4 years ($SD = 15.7$), completed the PATS, a sociodemographic questionnaire, a measure of perceived health risk, and the Preventive COVID-19 Infection Behaviors Scale. CFA models, Cronbach's alpha and the Composite Reliability Index coefficients were used to estimate reliability. In addition, Item Response Theory (IRT) methods were employed, specifically, the Graded Response Model. The results of the CFA indicated the presence of a single factor for the PATS and high reliability. The IRT results suggest that the PATS items may significantly differentiate responses based on trait level and that a person with low frequency of travel anxiety symptoms during the pandemic will tend to choose the lower response alternatives. Likewise, age, gender, health risk perception, and COVID-19 preventive behaviors



significantly predict travel anxiety. In conclusion, the PATS is a brief and reliable measure that appears to be a valid measure of travel anxiety symptoms in the general Peruvian population during the pandemic.

Keywords: travel anxiety; COVID-19; pandemic; validity.

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The tourism industry has always been sensitive to political changes, economic crises, environmental disasters, and health problems, such as infectious diseases (Jeon, & Yang, 2021). In this sense, the presence of infectious diseases, such as COVID-19, threatens the health of tourists and influences the choice of tourist destinations and the decision to travel or not (Chinazzi et al., 2020; Jeon, & Yang, 2021; Sánchez-Cañizares et al., 2021). The desire and decision to travel is closely associated with people's affective and emotional state, which was significantly affected by the COVID-19 pandemic (Flaherty, & Nasir, 2020; Gnoth et al., 2000; Luo & Lam, 2020; Magano et al., 2021). In this regard, concerns about contracting COVID-19 while traveling and the risk of infecting others while traveling or upon return home have added new feelings of fear and anxiety to the experience of traveling during the pandemic (Flaherty, & Nasir, 2020). This has led to a 22% drop in international tourist arrivals worldwide in the first quarter of 2020 and a 60-80% drop by the end of 2020, resulting in economic losses of close to US\$ 1.2 trillion and more than 120 million direct layoffs in tourism (UNWTO, 2020). In the case of Latin America, the visit of foreign tourists decreased by 45% in 2020 (World Travel & Tourism Council [WTTC], 2020). In Peru, the formal and informal tourism industry generated, before the pandemic, about \$22 billion (representing 9.7% of GDP); however, the pandemic wiped out tourism activity that employed approximately 1.4 million people (Zorrilla, 2021), generating financial losses close to \$170 million (Ruiz et al., 2020). Thus, fear and anxiety about traveling during the pandemic has impacted the tourism industry both nationally and internationally. While



tourism contributes to wellbeing and improved mental health (Buckley, 2020; Buckley, & Westaway, 2020; Hanna et al., 2019), uncertainty regarding the future of the pandemic has led to a lack of certainty regarding resuming tourist travel as in pre-pandemic times (Rokni, 2021). Safety is an important component for travel and tourism, which can be easily affected by global health issues, such as the COVID-19 pandemic, and generate symptoms of anxiety, stress, fear, and depression (Wang, & Ackerman, 2019; Zenker et al., 2021). Specifically, the severity of the threat and the increased perception of health risk would cause fear and anxiety when traveling, which motivates the emergence of protective travel behaviors, even after the pandemic outbreak (Zheng et al., 2021). In this sense, anxiety, fear, and high uncertainty due to COVID-19 may lead to significant changes in tourism behavior, such as modifying or canceling travel plans and avoiding crowding (Cooper, & Buckley, 2021; Han et al., 2019; Wang & Ackerman, 2019). This could jeopardize the benefits of tourism to mental health (Rokni, 2021). Thus, knowing that the COVID-19 pandemic has changed tourists' thoughts, feelings, and ways of traveling (Zenker & Kock, 2020), it is important to identify and measure the degree of COVID-19-related travel anxiety.

While clinical instruments exist to measure COVID-19 anxiety such as the Coronavirus Anxiety Scale (Lee, 2020), COVID-19 anxiety syndrome scale (Nikčević, & Spada, 2020) and the COVID-19 anxiety scale (Silva et al., 2020), these are not designed or validated for use in the tourism context. Furthermore, current tourism research has focused on the study of health risk perception and travel risk in general, but there are still few studies on tourism-related mental health problems during a pandemic (Zenker et al., 2021). In this context, Zenker et al (2021) developed the Pandemic (COVID-19) Anxiety Travel Scale (PATS) to measure cognitive symptoms of travel anxiety during the COVID-19 pandemic. This differentiates the PATS from other scales, such as the Coronavirus Anxiety Scale (Lee, 2020), which measures exclusively physiological symptoms that are not common and are more likely to be observed in specific travel situations, such as anxiety generated by flying (Nousi et al., 2008).

The initial psychometric study of the PATS was carried out with 4242 people from the USA and Denmark (Zenker et al., 2021), reporting a unidimensional 5-item structure, with adequate evidence of reliability (Cronbach's Alpha = .93 and Composite reliability = .93) which showed

adequate relationships with xenophobia, health risk perception and intention to travel. Although there are some studies that have used the PATS (Klabi, 2021; Morar et al., 2021), there are no other investigations that evaluate the psychometric properties of the PATS in other cultural contexts and languages, such as Spanish. Therefore, there is a need to translate it into Spanish and evaluate the evidence of its validity and reliability. Having a version of the PATS translated into Spanish allows us to take into account the sociolinguistic difference during the adaptation process and obtain adequate interpretations for specific cultural contexts (Peterson et al., 2017; Squires, et al., 2013).

Additionally, the previous psychometric study of the PATS used a procedure based on the Classical Test Theory (CTT); however, it is currently common to use Item Response Theory (IRT) methods to obtain information on the contribution of items to the estimation of reliability and evidence of validity of measurement instruments in psychiatry (Adler & Brodin, 2011). CTT models assess measurement instruments as a whole, assuming that all items provide the same construct information (Petrillo et al., 2015). In addition, they provide information on how the answers to the items are related; however, they do not consider how individuals would respond to the items (Hambleton et al., 1991). On the other hand, the models derived from the IRT provide information on the parameters of difficulty and discrimination of the items, regardless of the characteristics of the participants (Crocker, & Algina, 1986; Lord, 1980). Unlike CTT, which provides a single estimate of reliability, IRT models provide information at the item and test level, and identify items that contribute to a more accurate measurement (Cooper & Petrides, 2010). This suggests that the combined use of CTT and IRT models provides more complete psychometric information for measurement instruments.

In this sense, the aim of the present study was to evaluate the psychometric properties of the PATS. For this, CTT and IRT methods were used. Specifically, evidence of validity based on internal structure and reliability was assessed. Based on previous findings (Zenker et al., 2021), it is expected that the five PATS items are grouped into a single dimension and the model exhibits good reliability. In addition, despite the absence of previous research on the PATS using IRT models, adequate parameters of difficulty and discrimination of its items would be expected. The discrimination parameter (a) evaluates the ability of an item to differentiate between people



who exhibit different levels in the construct of interest, where a higher value of a would indicate greater discriminatory power of the item. Likewise, the difficulty parameter (b) allow identifies easy and difficult items. Low values of b indicate easy items and high values indicate difficult items (Montero, 2000).

Additionally, this study evaluated the evidence of validity based on the relationship with other variables. Analysis of the relationships between test scores and external variables is an important source of validity evidence (American Educational Research Association et al., 1999). Specifically, evidence of nomological validity was evaluated. Nomological validity is known as hypothesis or theoretical validity, and implies observing the association or relationship between the construct under study and other independent constructs, which quantify completely different attributes, with which the presence of a statistically significant relationship is known from experience or theory (Adcock & Collier, 2001). No unified theoretical model exists to explain emotional reactions during the pandemic (Taylor, 2022). However, COVID-19 may impact people's anxiety differentially, according to some sociodemographic and health factors (Caycho-Rodríguez et al., 2022). For this reason, a structural model was tested that related age, gender, number of trips prior to the pandemic, health risk perception, and COVID-19 preventive behaviors to travel anxiety. In this regard, we have tried to follow the analysis strategy used in the original PATS study. In this case, it is expected that higher health risk perception would be associated with higher travel anxiety and the occurrence of protective behaviors (Zheng et al., 2021). Likewise, the presence of anxiety symptoms would be expected to be related to taking measures to prevent infection (Wakashima et al., 2020). In addition, women would be expected to have higher travel anxiety during the pandemic (Mackett, 2021) as would younger people (Zenker et al., 2021).

Method

Sample and procedure

The present instrumental study (Ato et al., 2013) was conducted between April 12 and April 30, 2021. The target population was people over 18 years of age from Peru. An online survey was constructed and participants were invited to respond via social media (eg Facebook, Instagram) and email. Snowball sampling was used, where participants were encouraged to send the



online survey to family, friends, or other contacts. Online snowball sampling makes it possible to collect information from participants in different locations and achieve higher response rates compared to other sampling techniques. (Baltar, & Brunet, 2012). In addition, this type of sampling is common among COVID-19 studies (Pierce et al., 2020), due to pandemic-specific movement and interaction constraints. Likewise, it has been used in other instrument adaptation and validation studies during the COVID-19 pandemic (see, for example, Caycho-Rodríguez et al., 2021a; Caycho-Rodríguez et al., 2021b). Soper software (2021) was used to calculate the minimum number of participants. For this, 5 observed variables, 1 latent variable, an anticipated effect size ($\lambda = 0.3$), probability ($\alpha = 0.05$), and statistical power ($1 - \beta = 0.95$). The final sample included 454 participants, which is much higher than the minimum number of 100 participants suggested by the software.

The mean age of the participants was 31.4 years old ($SD = 15.7$). Overall, 68.3% were female and 31.7% were male. The majority of participants (77.1%) were single. Similarly, most were unemployed (44.3%) or had a temporary job (33.5%). Of the participants, 49.6% reported not having had COVID-19, but the vast majority did report having had family members (87%) or friends (84.8%) with COVID-19. 74.2% reported being exposed to information about COVID-19 less than 3 hours per week. Finally, the average number of trips before the pandemic was 2.26 times ($SD = 2.29$). More information on the sociodemographic variables of the participants can be found in table 1.



Table 1.
Sociodemographic variables

Variables	Frequencies	Percentage
Sex	144	31.7%
Men	310	68.3%
Women		
Marital Status		
Single	350	77.1%
Married	60	13.2%
Divorced	34	7.5%
Widowed	7	1.5%
Living Together	3	0.7%
Work		
Steady job	101	22.2%
Temporary job	152	33.5%
Unemployed	201	44.3%
COVID-19 Diagnosis		
Yes	117	25.8%
No	225	49.6%
Not sure, but think so	68	15%
Not sure, but think not	44	9.7%
Family Members with COVID-19 Diagnosis		
Yes	385	84.8%
No	69	15.2%
Friends with COVID-19 Diagnosis		
Yes	395	87%
No	59	13%
Time exposed to information about COVID-19		
1 to 3 hours	337	74.2%
4 to 6 hours	65	14.3%
7 to 9 hours	19	4.2%
More than 9 hours	33	7.3%

Measures

Socio-demographic variables

An ad hoc survey was developed to collect information on age, sex, place of residence, marital status, employment, whether the person has been diagnosed with COVID-19, whether the person has had relatives and friends diagnosed with COVID-19, how long the person has been exposed to information about COVID-19, and number of trips made before the pandemic.

Travel anxiety during the COVID-19 pandemic.



The Pandemic Anxiety Travel Scale (PATS; [Zenker et al., 2021](#)) was used to measure cognitive symptoms of travel anxiety during the COVID-19 pandemic. It consists of 5 items (e.g. "I am afraid to risk my life when I travel, because of COVID-19") that have seven Likert-type response options (from 1 = strongly disagree to 7 = strongly agree). The sum of the scores for each item yields a total PATS score ranging from 5 to 35, with higher scores indicating greater anxiety about traveling during the pandemic.

For the translation of the PATS, the forward-backward method was used. First, two independent translators, one with expertise in the topic of the impact of the COVID-19 pandemic on mental health and another with experience in the cultural and linguistic differences between English and Spanish, translated the scale from English to Spanish (direct translation). Both versions were then translated into English by another professional translator and another bilingual person with no information about the English version of the PATS. After the translated versions were compiled, they were compared and evaluated by a five-member panel of experts for inconsistencies and a harmonized version was developed. This harmonized version was applied to 20 Spanish speakers, correcting inconsistencies or grammatical errors, to then develop a final Spanish-language translation. The original English version and the version translated into Spanish can be seen in Table 2.

Table 2.

Original English version of the PATS, Spanish version of the PATS and descriptive statistics of the items

Item	Items from the original English version	Translation of the Items in the Spanish version	<i>M</i>	<i>SD</i>	<i>As</i>	<i>K</i>
1	COVID-19 make me worry a lot about my normal ways of travelling.	La COVID-19 hace que me preocupe mucho por mis formas habituales de viajar	4.27	1.97	-0.16	-1.14
2	It makes me uncomfortable to think about COVID-19 while planning my vacation	Me incomoda pensar en la COVID-19 mientras planifico mis vacaciones	4.45	1.96	-0.24	-1.11
3	I am afraid to risk my life when I travel, because of COVID-19.	Tengo miedo de arriesgar mi vida cuando viajo, a causa de la COVID-19	4.56	1.97	-0.29	-1.15
4	When watching news about COVID-19, I become nervous or anxious in regards to travel.	Cuando veo noticias sobre la COVID-19, me pongo nervioso o ansioso por viajar	3.46	2.02	0.38	-1.07
5	I do not feel safe to travel due to COVID-19	No me siento seguro de viajar debido a la COVID-19	4.37	2.01	-0.19	-1.18



This translation followed a process of forward and back translation with a focus group to review the translated Spanish version.

COVID-19 Risk Perception

A single item was used to assess the degree to which the individual perceives COVID-19 as a dangerous disease and has been used previously (Abdelrahman, 2020). The item was “how do you rate the danger of COVID-19 disease?”, which had five response options ranging from 1 = not dangerous at all to 5 = very dangerous.

COVID-19 preventive behaviors

The Preventive COVID-19 Infection Behaviors Scale (PCIBS; Chang et al., 2020), which assesses the frequency with which people perform preventive behaviors against COVID-19, was used. The version translated into Spanish and validated in twelve Latin American countries was used (Caycho-Rodríguez et al., 2021c). The PCIBS was developed based on the WHO recommendations and is made up of five items that measure five preventive behaviors. The items are scored from 1 (almost never) to 5 (almost always), where the sum of all the items allows a total score to be obtained. Higher scores on the PCIBS indicate a higher frequency of preventive behaviors in the face of the COVID-19 pandemic. In the present study, McDonald's ω for scores was .91.

Ethics

The study protocol received approval from the Ethics Committee of the Universidad Privada del Norte (registration number: 20213002). Participants were provided with information about the purpose and procedure of the study. In addition, it was reported that the study guaranteed their anonymity and the confidentiality of the information provided. After this, the participants gave their informed consent. Finally, they were informed of their right to withdraw from the study and retract their data at any time.

Data analyses

Descriptive statistics were calculated for all variables under study. Psychometric properties of the PATS were assessed. Specifically, the structure of the scales was tested with a one-factor CFA model. Reliability estimates for the anxiety factor were estimated with Cronbach's alpha and the Composite Reliability Index (CRI, [Raykov, 2001](#)). An IRT model was also estimated for the scale, and item and tests information curves were calculated. Then a Structural Equation Model (SEM) was specified to predict anxiety for travelling. The predictors included in the SEM were: age, sex, number of trips per year before the pandemic, health risk propensity, and preventive behavior. The CFA, the IRT model, and the SEM model were all estimated in Mplus 8.6 ([Muthén & Muthén, 1998-2017](#)) with Weighted Least Square Mean and Variance corrected (WLSMV) which is adequate when there are ordinal and non-normal variables in the dataset ([Li, 2016](#)). Model fit of the CFA and SEM models was assessed with the most used indices available for this method of estimation: chi-square, CFI, RMSEA and SRMR ([Beauducel, & Wittmann, 2005](#); [Padgett & Morgan, 2021](#)). Regarding the cut-off criteria for declaring a good model fit, the guidelines in [Marsh et al. \(2004\)](#) were followed: CFI above .90 (better if above .95), RMSEA and SRMR below .08 (and even better if it is below .05).

Additional psychometric analyzes were performed with Item Response Theory (IRT) models. Specifically, the Graded Response Model (GRM, [Samejima, 1997](#)) was used, adjusted to ordinal polytomous items ([Hambleton et al., 2010](#)). In the GRM, two parameters are estimated: the discrimination (a) and the difficulty (b). In the case of polytomous items, the difficulty is not only one difficulty parameter per item, but rather there are as many difficulty parameters as there are thresholds. That is, the number of response categories minus one. As the PATS uses a 7-point Likert style scale, that means there are 6 thresholds. The accuracy of estimation across the range of values of the construct in the GRM were analyzed via Item and Test Information Curves.

Results

Confirmatory Factor Analyses and Graded Response Model

The unidimensional CFA model fitted the data well: $\chi^2(5) = 61.68$, $p < .001$, CFI= .992, RMSEA = .158 (IC90% .124-.194), SRMR= .014. Standardized factor loadings may be seen in Table 3.

All of them are statistically significant and large, with the lowest factor loading being 0.72. The results of the CFA allowed us to estimate the reliability with the CRI. This reliability estimate was .932. Additionally, coefficient alpha was also calculated, with an estimate of .912.

After the unidimensionality of the scale was established with the CFA fit, the GRM was fitted to the data. A Graded Response Model, specifically a 2PL model, 2P-GRM was chosen because the scale is one-dimensional, but the assumption of a discriminant parameter between the items is not possible based on the results of the CFA model (Ferrando, 1996; Widaman & Reise, 1997). The parameter estimates for the discrimination and difficulty are shown in Table 3. All items were highly discriminant (> 1), and the most discriminant was item 3 (Hambleton et al., 2010). Finally, the thresholds for the difficulty parameters all increased monotonically, as expected.

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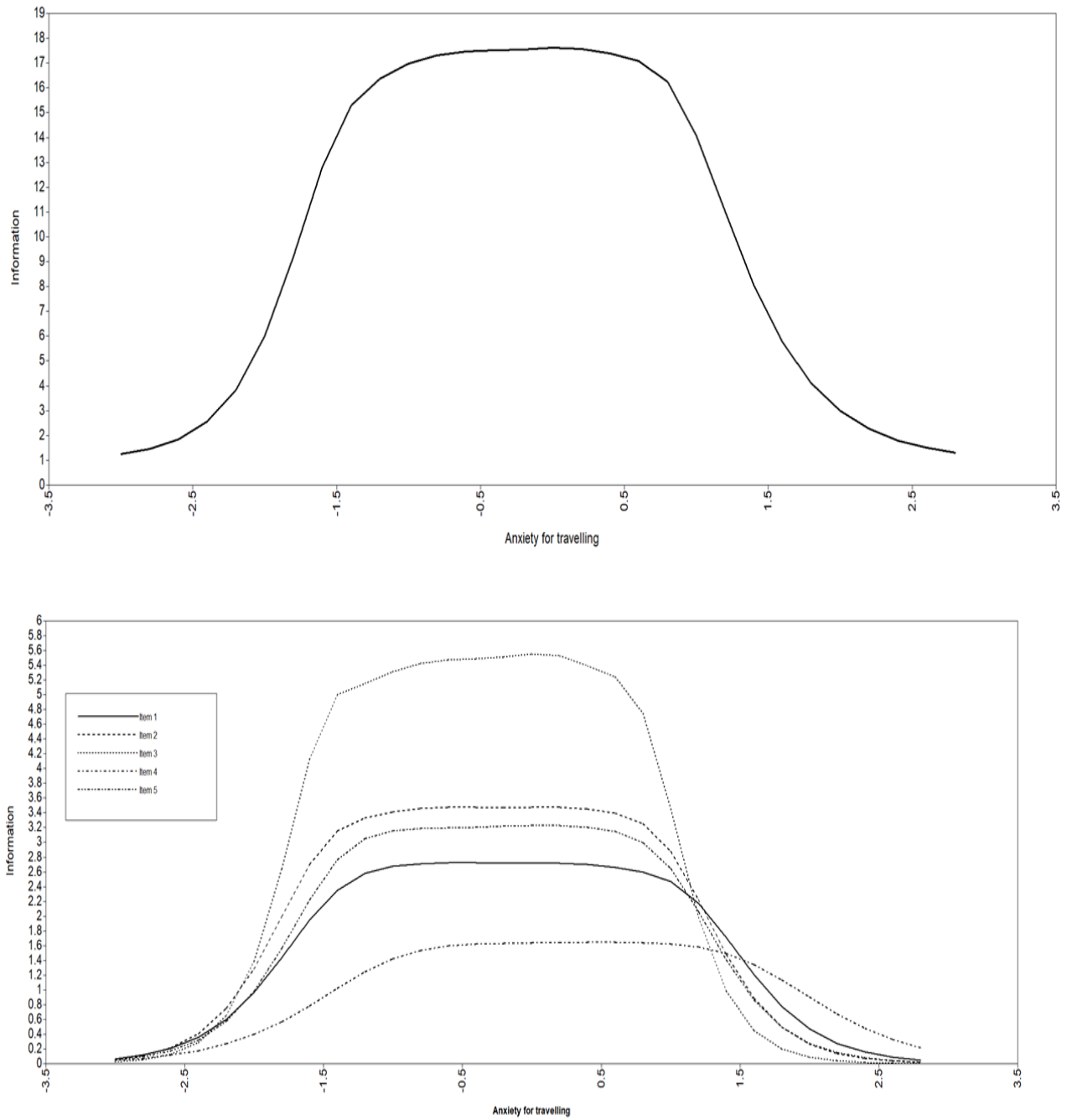


Figure 1. Item Information Curves for the scale and the items.

Figure 1 shows Item and Tests Information Curves (IIC and TIC, respectively), one ICC for each of the five items and one TIC, for the overall factor. The most informative (accurate across the scale of the dimension) was item three, and the least informative was item 5. The TIC shows that the test is more reliable (accurate or informative) in the range of the scale between -1.5 and 1.5 standard deviations of the construct.

Table 3.

Factor loadings, discrimination, and difficulty parameters for the five items of the pandemic travel anxiety scale.

Factor	Item	λ	a	b ₁	b ₂	b ₃	b ₄	b ₅	b ₆
Anxiety	I1	.842	2.94	-3.95	-2.50	-1.25	0.15	1.45	3.09
	I2	.868	3.34	-4.80	-3.06	-1.62	-0.09	1.34	2.99
	I3	.908	4.26	-6.12	-3.93	-2.14	-0.38	1.19	3.16
	I4	.789	2.26	-2.14	-1.02	0.15	1.24	2.23	3.27
	I5	.869	3.20	-4.28	-2.81	-1.32	0.04	1.34	2.84

λ = factor loading; a= discrimination parameters; b= difficulty parameters. *Structural Model to predict Anxiety for travelling*

A SEM was specified and tested to predict anxiety related to travelling during the pandemic. The predictors were age, sex, number of trips per year before the pandemic, health risk propensity, and preventive behavior. Preventive behavior was modeled as a latent variable. Predictors were assumed to be correlated. This model fit the data well: $\chi^2(66) = 215.40$, $p < .001$; RMSEA= .071 90% CI [.060 - .081]; CFI= .988; SRMR= .031. However, there were several correlations among the predictors that were not statistically significant. Therefore, these non-significant correlations were fixed to zero and a new model was estimated with improved fit: $\chi^2(74) = 156.07$, $p < .001$; RMSEA= .049 90% CI [.039 - .060]; CFI= .993; SRMR= .034.

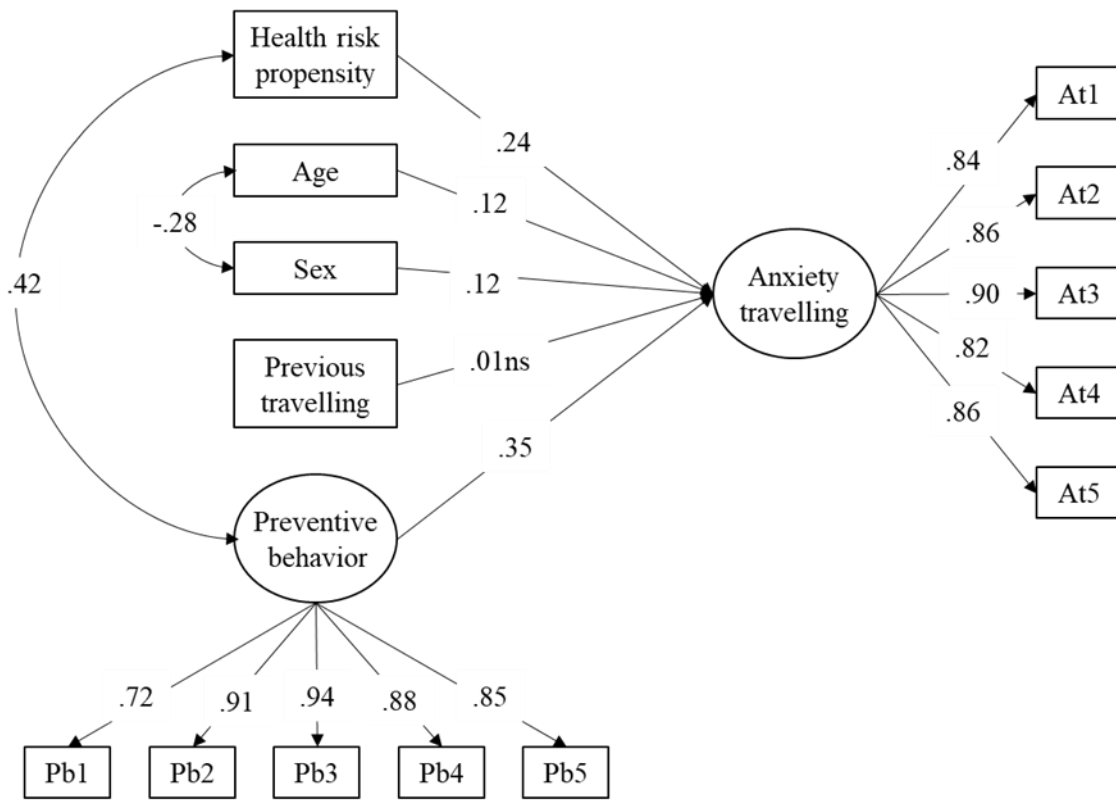


Figure 2. Standardized parameter estimates for the SEM model predicting Anxiety for travelling.

Standardized parameter estimates are presented in Figure 2. All of them were statistically significant except previous travelling. The best predictor of anxiety for traveling was preventive behavior. Overall, the percentage of variance for travel related anxiety during the pandemic explained by the predictors was 26.7%.

Discussion

The COVID-19 pandemic is currently the most important health problem with serious physical and mental health consequences. This makes it important to have measurement tools to investigate the effects of COVID-19 on people's mental health. Thus, the present study aimed to evaluate the psychometric properties of the Spanish version of the PATS, a scale recently designed to evaluate different symptoms of travel anxiety during the COVID-19 pandemic, in the general population of Peru.

The results of the CFA indicated the presence of a single factor for the PATS, further supporting the unidimensional structure found in the original study (Zenker et al, 2021). Understanding anxiety as a unidimensional construct is common in the psychological literature (Francis, et al., 2019; Olatunji & Wolitzky-Taylor, 2009), so the findings are consistent with this approach (Silva et al., 2020). Having a unidimensional measure allows for a parsimonious model, less complex and with few parameters that allow a better fit (Lúcio et al., 2021). In addition, the relatively high factor loadings showed that all items are adequate indicators of the construct (travel anxiety during the COVID-19 pandemic). However, the RMSEA value was higher than expected (Kline, 2015; Schumacker & Lomax, 2015). This is explained because, in factorial models with few degrees of freedom, such as the 5-item PATS model, the RMSEA performs poorly, even when the model is correctly specified. (Kenny et al., 2015; Taasobshirazi & Wang, 2016). The presence of models with high RMSEA values cannot be dismissed without evaluating the information derived from the other fit indices (Kenny et al., 2015). Moreover, the fit indices should be evaluated in conjunction with the magnitude of the factor loadings, which were high (> .80) in our data (McNeish et al., 2018). A model with correlated item errors, which could have improved the model, was not evaluated because it can generate errors of over or underestimation of reliability that would lead to an inadequate interpretation of the accuracy of the scale. This is due to the presence of variance not related to the construct (Yang, & Green, 2010). Also, the present study showed high reliability (Cronbach's Alpha = .91 and CRI = .93), which is similar to that reported in the original study (Cronbach's Alpha = .93 and Composite reliability = .93).



Regarding the IRT results, all items are highly discriminant, where the highest values are presented in items 2 and 3. This is expected, since anxiety about travelling due to the risk of the pandemic is one of the key factors that most influence tourists' travel planning and implementation (Bratić et al., 2021). Likewise, fear of contracting the virus and risking one's life is associated with the decision to avoid or postpone non-essential tourist trips (Miao et al., 2021). The results on discriminatory ability suggest that PATS items can significantly differentiate responses based on their trait level of travel anxiety. That is, the PATS items differentiate between the responses of a person with high levels of travel anxiety and another with a moderate or low level. In this sense, the PATS items would allow us to assess a wider range of people's levels of travel anxiety. On the other hand, as expected, the estimates of the difficulty parameters increased monotonically in an increasing manner. These findings suggest that a person with a low level of travel anxiety during the pandemic will be more likely to choose the lower response alternatives, while a person with a higher level of symptoms will choose the higher alternatives. This would be a reflection of the fact that the PATS items allow for responses in each point on the Likert style scale without losing some degree of information. Overall, the results of the GRM suggest that the PATS reliably measures travel anxiety during the pandemic along a wide range of the construct (mostly between approximately 1.5 *SD* below and 1 *SD* above the average, as shown in Figure 1).

Having demonstrated the internal structure and reliability of the PATS, we proceeded to assess the evidence of validity based on the relationship with other variables using a structural model that related age, sex, number of pre-pandemic trips, health risk perception, and COVID-19 preventive behaviors to travel anxiety. First, sex was a significant predictor variable and, as expected, women reported higher levels of travel anxiety during the pandemic than men. Overall, this finding is supported by previous studies reporting a higher risk in women of developing anxiety during the pandemic (Santomauro, et al., 2021; Xiong et al., 2020; Vindegaard, & Benros, 2020). This can be explained based on previous studies, where women are more affected by the social and economic consequences of the pandemic (Burki, 2020; Wenham et al., 2020). In this sense, the greater presence of anxiety symptoms may be related to the greater likelihood of women taking on domestic and caring responsibilities, along with financial disadvantage during the pandemic, due to lower wages, less ability to save, and less



secure employment (Burki, 2020; Osland, et al., 2020; Wenham et al., 2020). These results are important, as anxiety is one of the factors that negatively affect women's travel intentions (Karagöz et al., 2021; Wantono & McKercher, 2020). In the case of age, the results of the study indicated that age is a significant predictor of travel anxiety, where older age would be associated with higher levels of anxiety. In this sense, it is reasonable to expect that older people's levels of travel anxiety would be different from those of younger people. This can be explained by the fact that younger people present less risk related to tourism, which is associated with lower levels of travel anxiety (Gibson & Yiannakis, 2002).

On the other hand, the number of trips prior to the pandemic was not a significant predictor variable, despite evidence suggesting the presence of lower levels of anxiety in people with more previous travel experience (Chang, 2013). One variable that could explain this relationship, and should be taken into account in future research, is the personality of the tourist. For example, according to Plog's psychographic personality model (Griffith, & Albanese, 1996), tourists with an adventurous personality have more self-confidence in unfamiliar environments, which reduces their levels of travel anxiety (Chang, 2013).

The results confirm that the perception of COVID-9 risk has a significant positive impact on the level of travel anxiety during the pandemic. Thus, any increase in COVID-19 risk perception will make people feel more anxious about travelling during the pandemic and, therefore, they would be more likely to cancel their travel plans (Angguni, & Lenggogeni, 2021). This is in line with anxiety/uncertainty management theory (Gudykunst & Hammer, 1988), which states that when people experience uncertainty or increased risk, higher levels of anxiety appear, making it difficult to adapt to a new environment; however, when uncertainty is controlled, people tend to adapt better. Likewise, the COVID-19 pandemic has made people more concerned about taking safety measures to avoid becoming infected with the virus. This helps explain how, in this study, travel anxiety predicts preventive behavior. In this sense, those people who experience greater anxiety about traveling during the COVID-19 pandemic present greater preventive behaviors. According to Taylor (2019), this would be expected, since people with a higher level of anxiety present greater psychological distress and a greater perception of vulnerability to COVID-19, which tends to lead to the appearance of more preventive behaviors. (Chien, et al., 2017).

Currently, due to the COVID-19 pandemic, people perceive that their health may be highly threatened, leading to high levels of anxiety and a higher frequency of preventive behaviors. This is to be expected in the Peruvian case, since, during the period of time in which the study data were collected, the greatest increase in the number of diagnosed cases and deaths from COVID-19 was observed, with an average of 3,500 confirmed cases and 320 deaths per day (Ministerio de Salud, 2021). The above results demonstrate the hypothesized relationships between travel anxiety during the pandemic and other independent constructs.

Limitations and future research suggestions

This study is not without limitations. First, participants were selected through snowball sampling and were not necessarily representative of the general population of Peru, which limits the generalizability of the results. Future studies need to use nationally representative samples to confirm the results presented. In addition, the use of an online survey to collect information left out those participants who did not have access to the internet or who lacked experience in responding to this type of survey. This weakens the generalizability of the findings. Second, travel anxiety was assessed with a self-report measure, where responses may be influenced by social desirability biases. Therefore, future studies should use additional methods to collect information, such as in-depth interviews or biomarkers such as heart rate. Third, there are relatively fewer confirmed cases of COVID-19 in the sample (specifically, 25.8% of the total number of participants). Therefore, it is possible that participants in the present study were less anxious due to COVID-19 compared to other comparable groups from Latin American countries or other regions of Peru that have been more affected by the pandemic. Fourth, the data were collected at a single point in time, and therefore, the reported relationships between variables provide little information about causality. Therefore, further research should use longitudinal designs that assess the relationships between travel anxiety and other variables during the pandemic. Regarding the psychometric analysis, the transversal design did not allow us to examine the longitudinal measurement invariance that examines the equality of the factor structure of the PATS over time. The presence of longitudinal measurement invariance would allow us to be certain that the construct can be assessed over time (Wu et al., 2009). This would provide strong evidence for comparing means at different time periods during the pandemic.

Thus, the longitudinal measurement invariance of the test needs to be studied (Brown, 2015). It was also not possible to evaluate test-retest reliability, which seeks to quantify the true variance in a two-time measurement by controlling for transient error (Green, 2003) as well as providing additional evidence of the stability of the PATS over time. Fifth, regarding the evidence of nomological validity, not all hypothesized relationships between travel anxiety during the pandemic and other variables were assessed, such as, for example, resilience, (Flaherty & Nasir, 2020), social isolation, well-being and motivation to travel (Çolakoğlu et al., 2021), fear of COVID-19 and intention to travel (Tepavčević et al., 2021). Thus future studies should further develop the relationship model by adding some of the variables mentioned above and providing more evidence of nomological validity.

Despite these limitations, the results have important practical implications. Studies conducted during the current pandemic could benefit from including, in their protocols, an assessment of travel anxiety, not only as an outcome measure, but also as an explanatory variable related to travel intention (Zenker, et al., 2021). In addition, the assessment of travel anxiety among different populations and its relationship to specific demographic variables, would allow for the identification of potential risk groups. This could help health care professionals detect those individuals most likely to exhibit symptoms of travel anxiety during the COVID-19 pandemic and develop psychological interventions to alleviate the traumatic effects of COVID-19. Similarly, determining at-risk groups based on predictor variables is important for developing prevention programs to help overcome travel anxiety during the pandemic (Pakpour & Griffiths, 2020). These findings highlight the importance of developing strategies to eliminate people's negative perceptions of travel during the pandemic and restore intentions to visit different tourism destinations during and after the pandemic. In this sense, tourism-related institutions can develop options that are tailored to the needs of tourists during times of health crisis. In addition, the results on travel anxiety during the pandemic could be useful parameters to understand similar events in the future (Silva, et al., 2020). Thus, for example, the PATS can be used after the COVID-19 pandemic, replacing the term "COVID-19" with other terms referring to new public health problems. Finally, unlike other scales, the PATS assesses anxious symptomatology in the specific context of tourist travel within the COVID-19 pandemic as a

source of anxiety. Furthermore, the PATS differs from other scales in that it is based on the measurement of cognitive symptoms of anxiety.

Conclusion

In conclusion, the PATS is a brief and reliable instrument that appears to be a valid measure of travel anxiety symptoms in the general Peruvian population during the pandemic. However, other studies should replicate these findings in order to understand whether this construct can be validly and reliably measured in other countries.

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Competing Interests

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